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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/416,042 10/12/99 ROBERTS

M 05868-USA

023543 QM01/0929  
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EXAMINER

DOERRLER, W

ART UNIT

PAPER NUMBER

3744

DATE MAILED: 09/29/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/416,042

Applicant(s)

Roberts et al

Examiner

William C. Doerrler

Group Art Unit

3744



☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-26 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-26 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892 ✓

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2 and 3 ✓ ✓

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6 and 16-21, 25 and <sup>26</sup>25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 6 and 16, "the second recirculating refrigeration circuit" lacks clear antecedent basis since claim 1 does not mention that the refrigerant in the second refrigeration circuit is recirculated.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was

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commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-5, 7-12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaumer et al in view of Herron et al.

Gaumer et al discloses applicants' basic inventive concept, a liquefaction device for natural gas with two refrigerant circuits with different refrigerants, substantially as claimed with the exception of work expanding the refrigerant. Herron et al shows this feature to be old in the natural gas liquefaction art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Herron et al to modify the natural gas liquefaction device of Gaumer et al by work expanding the refrigerant to derive energy which can be used for compressing the refrigerant to increase the liquefaction capacity of the process.

5. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaumer et al in view of Herron et al as applied to claims 1-5, 7-12 and 22 above, and further in view of Liu et al.

Gaumer et al, as modified, discloses applicants' basic inventive concept, a natural gas liquefaction system which uses a plurality of refrigeration circuits and work expansion in the cooling process, substantially as claimed with the exception of using a third refrigeration circuit to remove heat

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from the first cooling system. Liu shows this feature to be old in the natural gas liquefaction system. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Liu et al to modify the natural gas liquefaction system of Gaumer et al by using a third cooling system to remove heat from the first refrigeration system to improve the efficiency of the first system. In regard to multiple refrigerants in the third cooling system, multiple refrigerant systems are well known in the refrigeration system for liquefaction art, as shown in the other cited references, and as such would have been an obvious modification for an ordinary practitioner in the art to improve control over and widen the possible range of the expansion temperature of the refrigerant.

***Allowable Subject Matter***

6. Claims 6, 16-21, 25 and 26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

23, 24,

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Low et al and Capron et al show natural gas liquefaction systems.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (703) 308-0696.



**WILLIAM DOERRLER  
PRIMARY EXAMINER**

William C. Doerrler  
Patent Examiner  
TC 3744  
September 27, 2000